

oscillating electrical energy is applied to one of the conductors and the junction is configured such that a touch by a conductive object causes an a.c. short at the junction, the detector being configured to detect the oscillating signal at the second conductor as the capacitive effect and to infer the touch.

[0043] Preferably, the detection circuitry is configured to interpret a property of a detected signal as a number of touches of a corresponding conductor.

[0044] The detector may comprise a matrix of first sensors aligned in a first direction and second sensors aligned in a second direction with a plurality of junctions in between. There may additionally be provided a tabulation of leakage capacitance values for each junction, the detector being configured to use the leakage capacitance values to correct readings at each conductor.

[0045] Preferably, the source of oscillating electrical energy is connected to oscillate at least one of the detector, part of the detector and the at least one conductor with respect to a reference voltage level, thereby to permit a capacitive current flow between the conductive object and the at least one conductor.

[0046] Preferably, the source of oscillating energy is connected to oscillate a first part of the detector, and wherein the first part is connected to a second part not subject to oscillations via a communication connection unaffected by the potential difference between the first and the second parts of the detector.

[0047] Preferably, the communication connection comprises at least one differential amplifier.

[0048] Preferably, the sensor is configured with a transparent medium between itself and the display screen.

[0049] Preferably, the transparent medium comprises an air gap.

[0050] Preferably, the sensor comprises a grid of conductors arranged within a layer thereof.

[0051] Preferably, the conductors are connected pairwise to amplifiers.

[0052] Preferably, the amplifiers are differential amplifiers each having a positive input and a negative input and wherein one conductor of the pair is connected to the positive input and a second conductor of the pair is connected to the negative input.

[0053] The detector may comprise a compensation table for providing a compensation value at each conductor to compensate for static noise.

[0054] The detector may be configured to update the compensation table upon system startup.

[0055] The detector may be configured to use an ambiguous object detection as a trigger to refresh the compensation table.

[0056] Preferably, any combination of number, phase and position data from detected signals are used to define ambiguity in object detection.

[0057] According to a third aspect of the present invention there is provided a method of touch sensing at a matrix of sensing conductors located in a transparent sensor over an electronic display screen, comprising:

[0058] providing an oscillating signal at a predetermined frequency, and

[0059] measuring the conductors for capacitive effects on the conductors due to touch thereon.

[0060] The method may comprise providing the oscillating signal to an external transmitter to energize a touching body part.

[0061] Preferably, the matrix comprises first conductors aligned in a first direction and second conductors aligned in a second direction, the method comprising providing the oscillating signal to the first conductors and sensing the oscillating signal at any of the second conductors to which the signal has been passed by a capacitive link caused by a touching conductive object.

[0062] The method may comprise providing the oscillating signal to at least the conductors such that a conductive touching body drains current from a respective conductor.

[0063] The method may comprise using the oscillating signal to oscillate a detection mechanism comprising the conductors wherein the oscillated detection mechanism is simultaneously isolated from common ground.

[0064] The method may comprise using the oscillating signal to oscillate a first part of a detection mechanism, the first part comprising the conductors,

[0065] isolating the first part from a second part, and

[0066] using the isolated second part to communicate touch detection outputs to external devices.

[0067] According to a fourth aspect of the present invention there is provided a method of manufacture of a touch detector for an electronic display screen, comprising:

[0068] providing an oscillation signal source,

[0069] embedding a grid of transparent conductors within at least one transparent foil,

[0070] placing the transparent foil over the electronic display screen, and

[0071] providing detection circuitry for detecting capacitive effects on the conductors.

[0072] The method may comprise applying an excitation unit about the electronic screen for exciting an electromagnetic stylus, so that location of the stylus is detectable at the grid of transparent conductors.

[0073] According to a fifth aspect of the present invention there is provided a Touch detection apparatus comprising:

[0074] a sensor comprising at least one sensing conductive element,

[0075] an oscillator for providing an oscillation signal,

[0076] a transmitter, associated with the oscillator, for transmitting the oscillation signal in the vicinity of the sensor,